

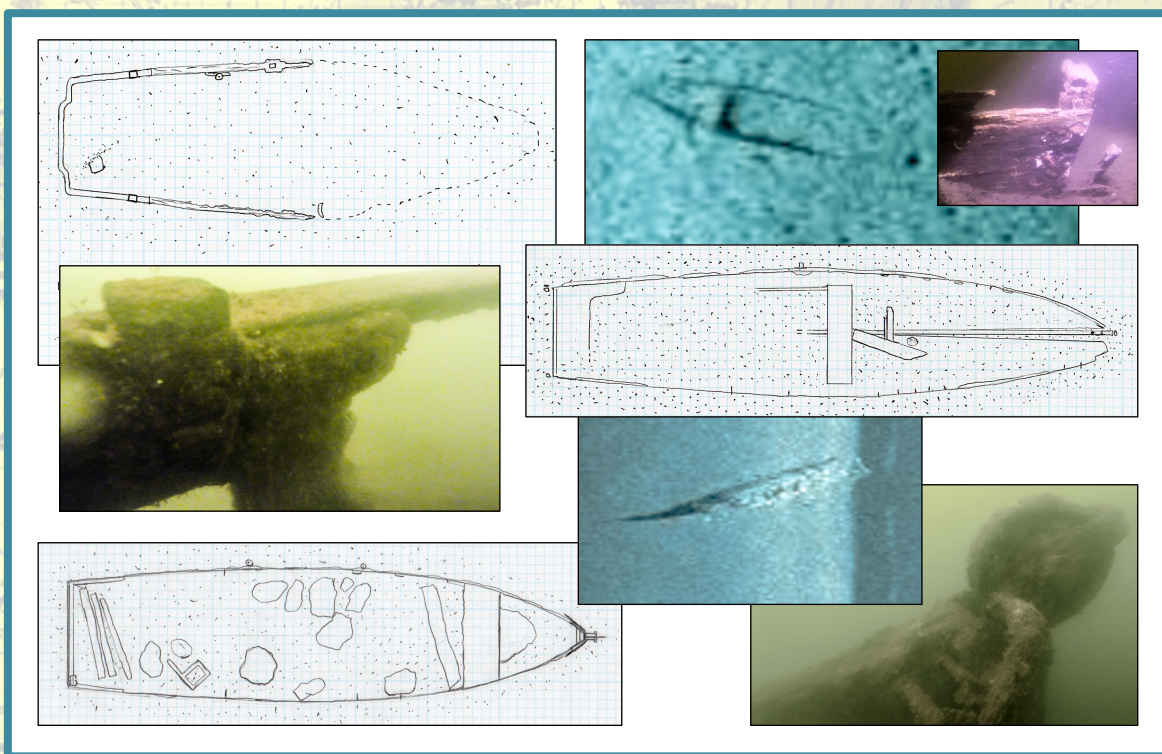


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Christopher Olson
Minnesota Archaeological License 22-075



Minnesota Suburban Lakes Projects Series
Southern and West Metro Lakes Underwater Archaeology Project

Lotus Lake Underwater Archaeology Project Report



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Ann Merriman, Christopher Olson, and Maritime Heritage Minnesota

Acknowledgments

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Maritime Heritage Minnesota



Staff, Volunteers, Board of Trustees, and Mascots

“...grants have allowed a small St. Paul-based nonprofit, Maritime Heritage Minnesota (MHM), to re-establish the discipline of underwater archaeology in Minnesota. Without this support, MHM could not have conducted its groundbreaking nautical archeological and maritime historical research.”

~Steve Elliott, Former Minnesota Historical Society CEO and Director, January 2015

Introduction

Wrecks and the artifacts associated with them tell a story. Removing or otherwise disturbing artifacts, treating them as commodities that can be sold, obliterates that story. Nautical archaeological and maritime sites are finite, and are significant submerged cultural resources. Nautical, maritime, underwater, maritime terrestrial – Maritime Heritage Minnesota's (MHM) deals with all of these types of sites throughout the State of Minnesota. MHM's Mission is to document, conserve, preserve, and when necessary, excavate these finite cultural resources where the welfare of the artifact is paramount. MHM is concerned with protecting our underwater and maritime sites – our shared Maritime History – for their own benefit in order for all Minnesotans to gain the knowledge that can be obtained through their study. MHM's study of wrecks does not include the removal of artifacts or damaging the sites in any way. MHM does not raise wrecks or 'hunt' for 'treasure'. Submerged archaeological sites in Minnesota are subject to the same State statutes as terrestrial sites: the Minnesota Field Archaeology Act (1963), Minnesota Historic Sites Act (1965), the Minnesota Historic District Act (1971), and the Minnesota Private Cemeteries Act (1976) if human remains are associated with a submerged site. Further, the case of *State v. Bollenbach* (1954) and the Federal Abandoned Shipwrecks Act of 1987 provide additional jurisdictional considerations when determining State oversight and "ownership" of resources defined by law as archaeological sites (Marken, Ollendorf, Nunnally, and Anfinson 1997, 3-4). Therefore, just like terrestrial archaeologists working for the State or with contract firms, underwater archaeologists are required to have the necessary education, appropriate credentials, and hold valid licenses from the Office of the State Archaeologist (OSA).

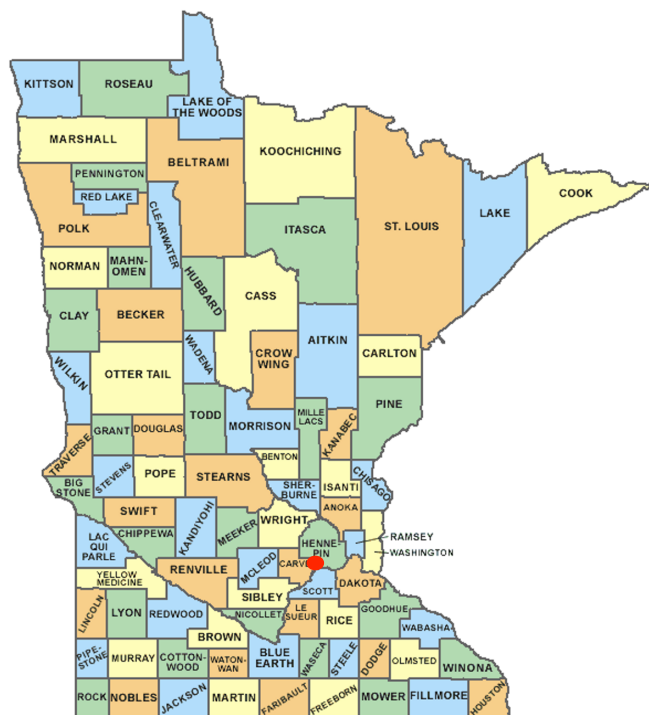
Research Design and Methodology

This project is a significant step toward the comprehensive identification, documentation, preservation, and conservation of submerged cultural resources in Minnesota. The Lotus Lake Underwater Archaeology Project (LLUA) in Carver County is part of the Southern and West Metro Lakes Underwater Archaeology Project (SWMLUA) that falls under the umbrella program, the Minnesota Suburban Lakes Survey Projects (MSLS). Crystal Lake in Dakota County, Lake Minnewashta in Carver County, and Scott County's Prior Lake were also investigated during the SWMLUA Project. The purpose of the LLUA Project as part of the SWMLUA Project is to increase the collective maritime archaeological and historical knowledge of Minnesotans through the analysis of anomalies recorded on the bottoms of our state's suburban lakes during side and down-imaging sonar surveys. The LLUA Project is a Phase 1 underwater archaeological diving reconnaissance survey designed to locate, identify, and rudimentarily document objects - wrecks and other sites - on the lake bottom.

Prior to the beginning of the SWMLUA Project, MHM located and identified watercraft wrecks on the bottom of smaller Minnesota suburban lakes including nearby Christmas Lake, Prior Lake, Medicine Lake, Lake Johanna, and Forest Lake. MHM has also identified and documented wrecks in larger lakes including Lake Minnetonka, White Bear Lake, and Lake Waconia. MHM recognized 22 anomalies on the lake bottom during the remote sensing survey of Lotus Lake in 2020. During the 2022 fieldwork season, MHM and its volunteers located and dove on 3 anomalies in the lake. MHM conducted the diving reconnaissance in Lotus Lake during 1 day of fieldwork in early August. MHM used its research boat, *Anomaly 51*, to pinpoint the dive locations using embedded GPS data collected during sonar recording review, and a weighted Diver Down Buoy was deployed at the proper coordinates. MHM's Underwater Archaeologists and Volunteers then descended to the lake bottom to locate and document the anomalies. Using data accumulated from the fieldwork as a starting point, MHM conducted research to place newly recognized nautical archaeological sites and anomalies into their historical contexts. Minnesota Archaeological Site Forms were filed with the Office of the State Archaeologist (OSA) for the 3 anomalies investigated and identified.



A map of Lotus Lake
(USGS 1958)



The red circle marks the location
of Lotus Lake in Chanhassen in
Carver County

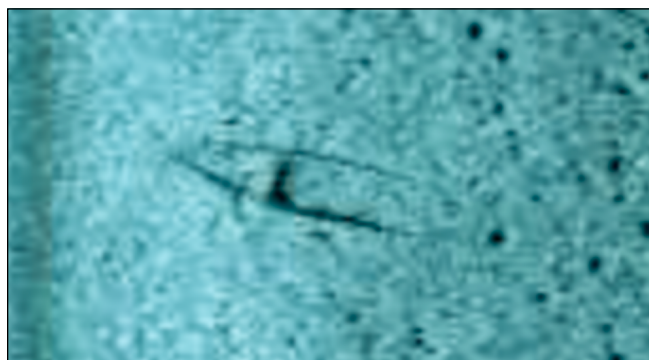
Results: Lotus Lake Underwater Archaeological Reconnaissance

After the completion of the LLUA/SWMLUA Project fieldwork in Lotus Lake in August 2022, there are now 3 identified wrecks on the lake bottom. Eighteen other anomalies have not been investigated yet and their sonar signatures indicate their documentation in the future will produce promising results. The anomalies were identified through underwater archaeological reconnaissance fieldwork using SCUBA, digital video, measured drawings, side and down-imaging sonar, and maritime historical research. The 3 identified wrecks in Lotus Lake - Anomalies 1, 10, and 11 - now have Minnesota Archaeological Site numbers.

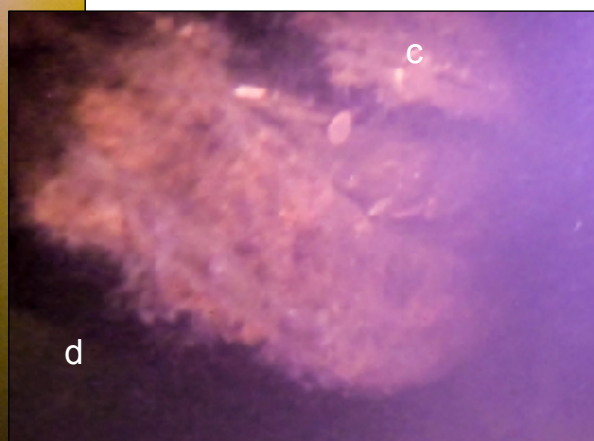
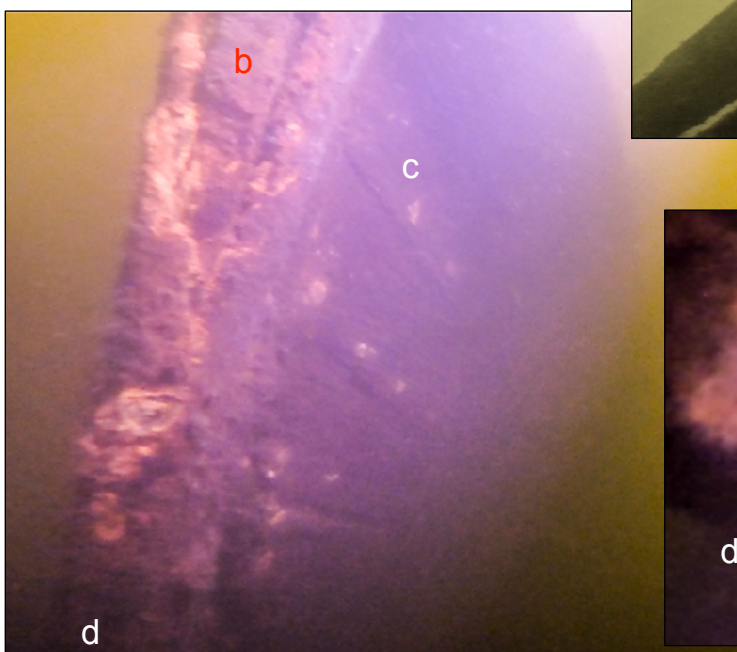
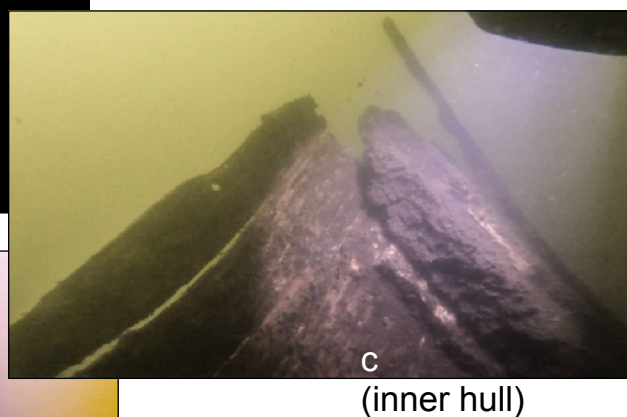
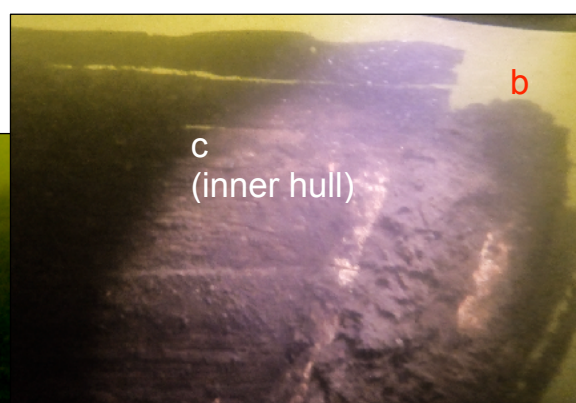
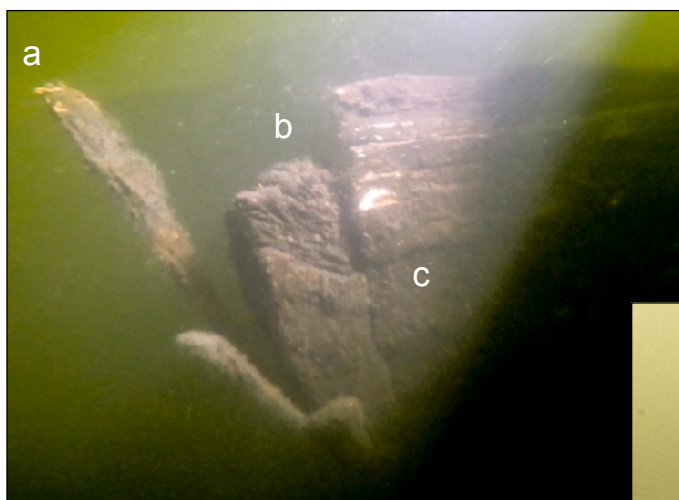
Wooden Lapstrake Wreck, 21-CR-178 (Anomaly 1)

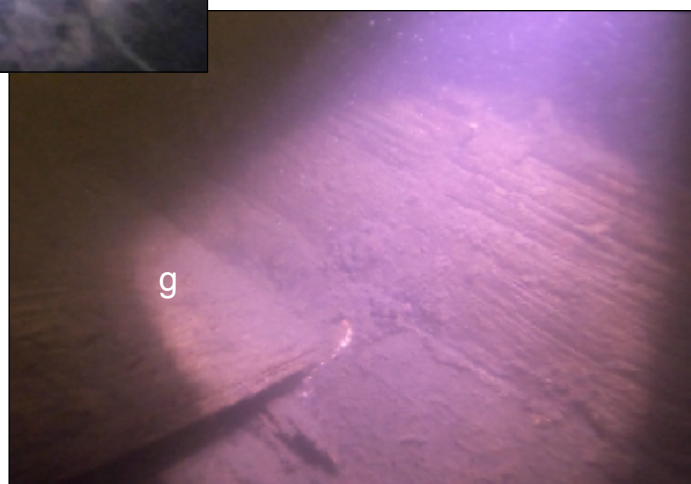
MHM recorded a sonar image of the Wooden Lapstrake Wreck (Anomaly 1) during the Lotus Lake Sonar Survey as part of the Minnesota Suburban Lakes Projects on October 18, 2020; the image was clearly a wreck. Underwater archaeological reconnaissance was conducted to identify and rudimentarily document Anomaly 1 took place during the Southern and West Metro Lakes Underwater Archaeology Project. The Wooden Lapstrake Wreck is 15.10 feet long, 3.50 feet in the beam, and 2.20 feet at the transom. She is of lapstrake - clinker-built - construction with strakes that are comprised of uniform width. A rubrail with a rectangular profile survives nearly intact on the port side, with the exception of the port bow and quarter; the port quarter sheer strake is also missing. On the starboard side amidships, where the hull is intact but mostly buried, the gunwale is comprised of sturdy stringers. At the bow, the stempost is intact and the starboard side bow has significantly separated from the post and keel, while the port side has only moved away from the centerline by a few inches. The split in the bow extends aft, encompassing at least one-half of the wreck. The keelson and bottom hull strakes - possibly even sister keelsons - are visible under a thin layer of silt amidships and forward. Few frames, at least at the futtock-level, survive but remnants of at least one rectangular frame is seen on the inner port side hull. This frame style was used in more basic boat designs as opposed to more finely-crafted small boats with numerous thin frames in their construction. An amidships bench survives and is wedged against and attached to the inner hull on both port and starboard, supported by longitudinal stringers. Another bench, this one fashioned to fit into the stern area and both quarters in a U-shape, remains intact. The square transom is intact and rather thick and heavy, with bits of gunwale lying off the stern at both port and starboard. The design and construction of the transom and both quarters is 'primitive' when compared to the quality lapstrake construction of the hull's sides. This 'rough' design would not affect the stability or performance of the boat, but it indicates the wreck is a transitional craft; she is more advanced than flat-bottomed 'Fisherman's Friend' models and is a precursor to multiple thin-framed small boats referred to as 'family models'. Throughout the wreck, wire nails hold it together along with some slot-head woodscrews, and some white paint survives. In terms of other similar archaeological sites, 21-HE-513 on the bottom of Lake Minnetonka - the Wooden Motor Boat Wreck 4 - is a carvel-built (smooth hull) multi-thin framed version of Anomaly 1 with a finely-crafted transom. Additionally, the Wineglass Stern Wreck 6 (21-HE-541) in Christmas Lake is a finely carvel-built version of Anomaly 1 with slat-frames and a narrow wineglass stern used for slow rowing

pleasure boating. Therefore, MHM contends Anomaly 1 is older than 21-HE-513 and 21-HE-541 and constructed around 1895; she sank around 1915 based on the wreck's condition and the amount of silt-build up in the stern area of the wreck. MHM submitted a Minnesota Archaeological Site Form to the OSA and Anomaly 1 received her site number - 21-CR-178 - at that time. 21-CR-178 is protected under the Federal Abandoned Shipwreck Act of 1987 and 1954 Minnesota State Law.

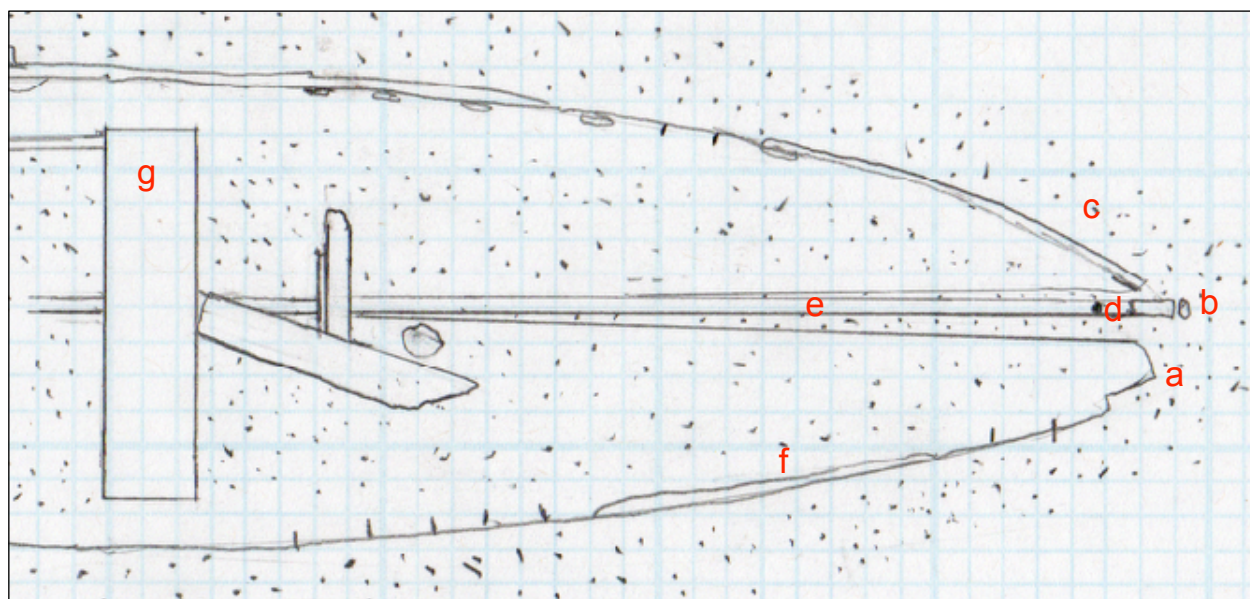


- a: Separated Starboard Side
- b: Stempost
- c: Port Side
- d: Keel
- e: Keelson
- f: Starboard Gunwale
- g: Amidships Bench

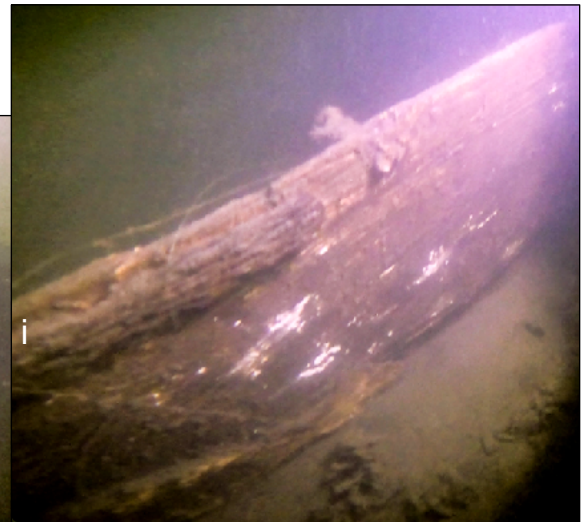
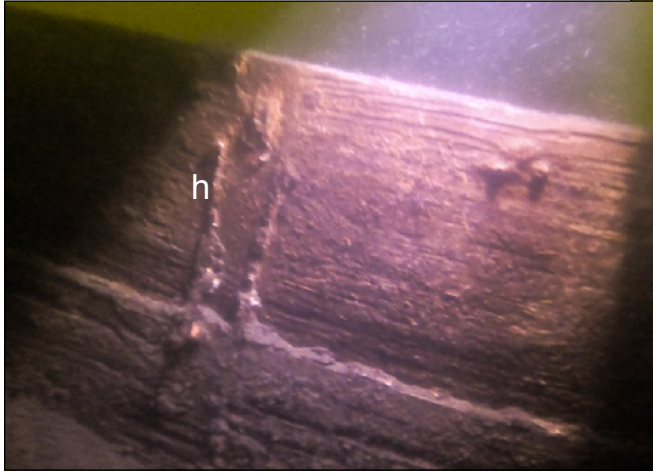




- a: Separated Starboard Side
- b: Stempost
- c: Port Side
- d: Keel
- e: Keelson
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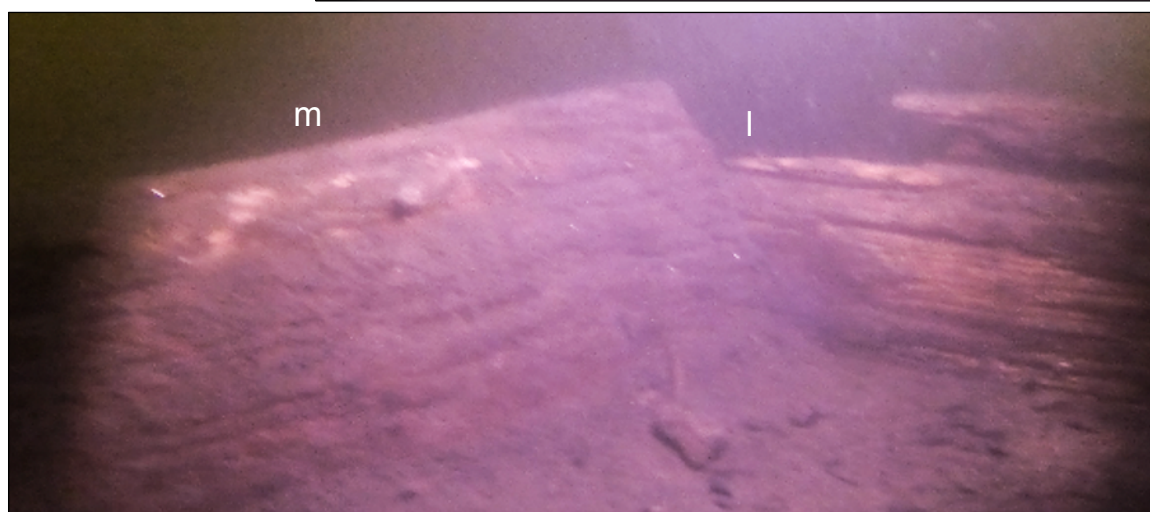
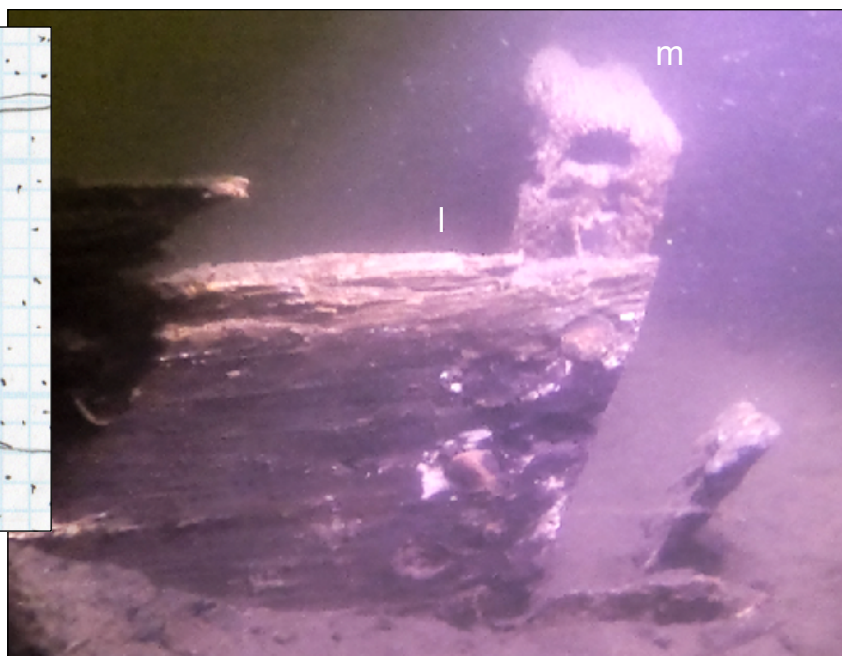
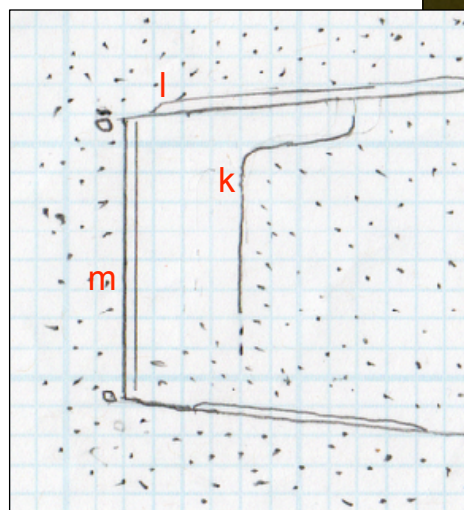
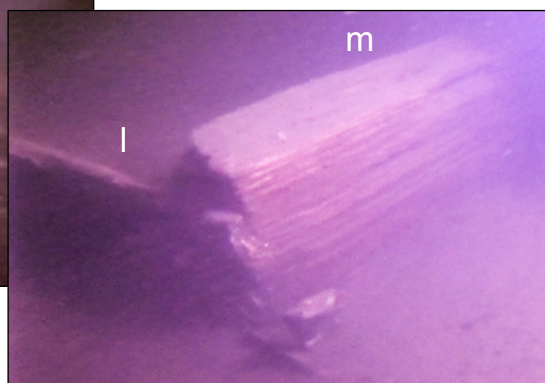


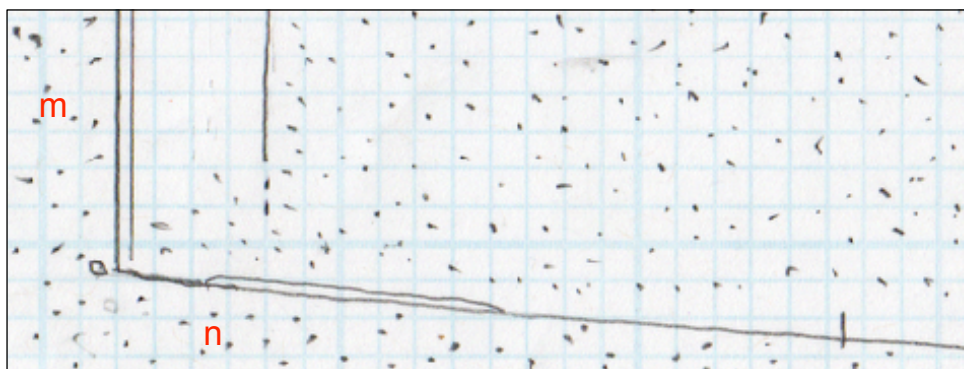
h: Missing Futtock (Frame) Evidence
i: Rubrail
j: Lapstrake (Clinker-Built) Construction



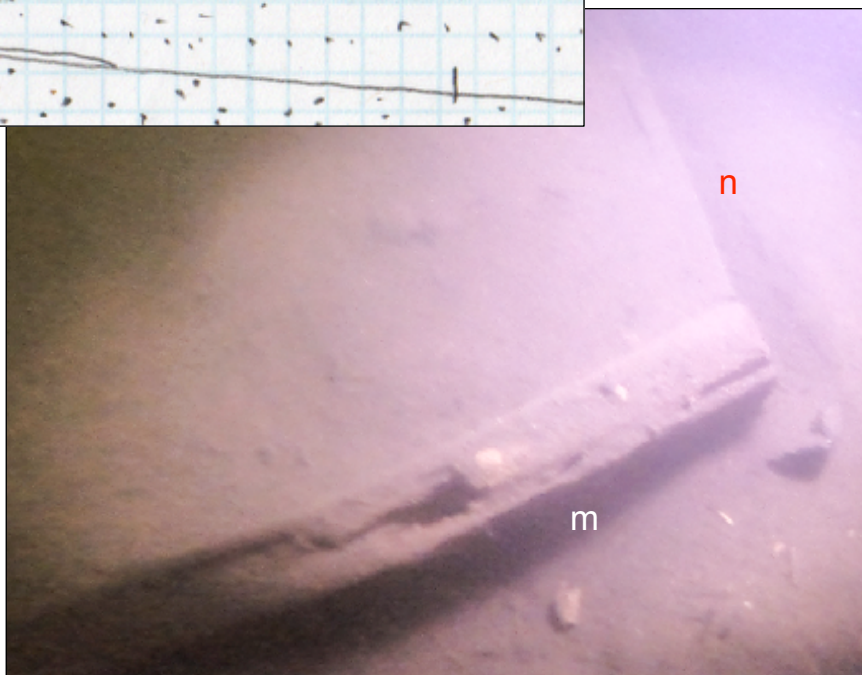


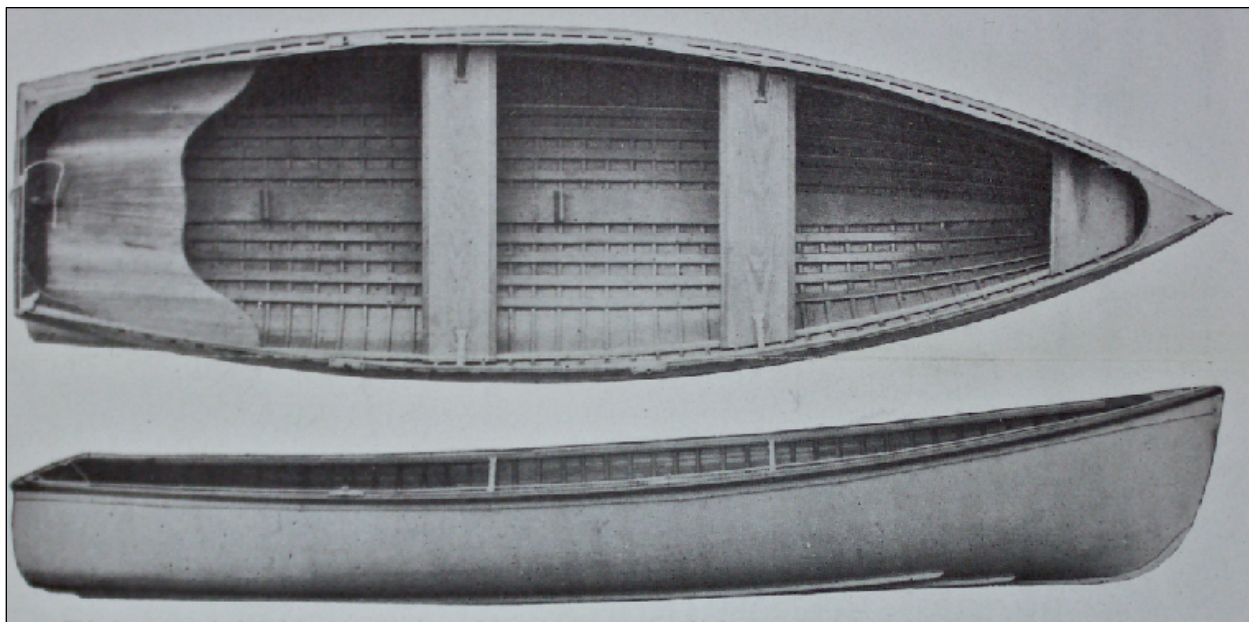
k: Rear U-Shaped Bench
l: Port Quarter
m: Transom





m: Transom
n: Starboard Quarter





The Ramaley Standard Model Smooth Skin Detachable Motor Boat is similar to Anomaly 1 in design but not construction due to the smooth hull. The stern and transom of this boat reflect a later construction than Anomaly 1 (Ramaley Boat Company 1912).

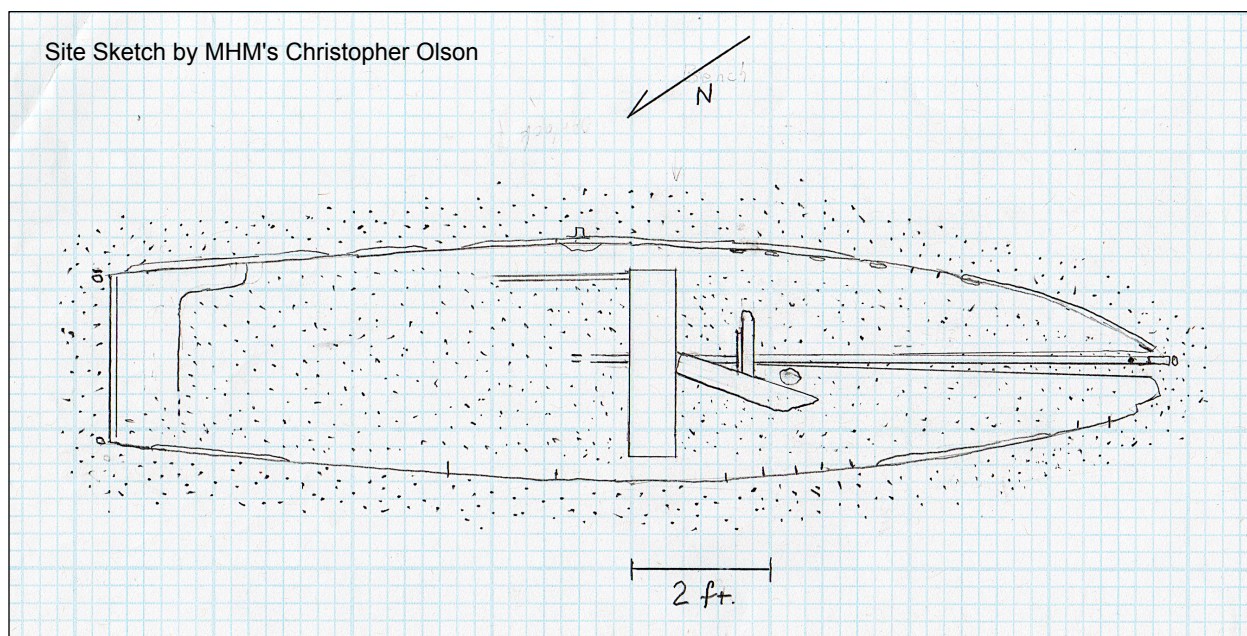
Built in Wayzata on Lake Minnetonka



This lapstrake boat- clinker-built - constructed by Joseph Dingle Boat Works around 1915-1920. This Dingle boat nearly the same dimensions of Anomaly 1 with the exception of the transom width. This boat also has a U-shaped back bench and an amidships bench; the biggest differences are the extra bench, foredeck, and the finally-crafted transom designed to accommodate an outboard motor (Merriman and Olson 2017, 21-36).

Built in St Paul on the Mississippi River

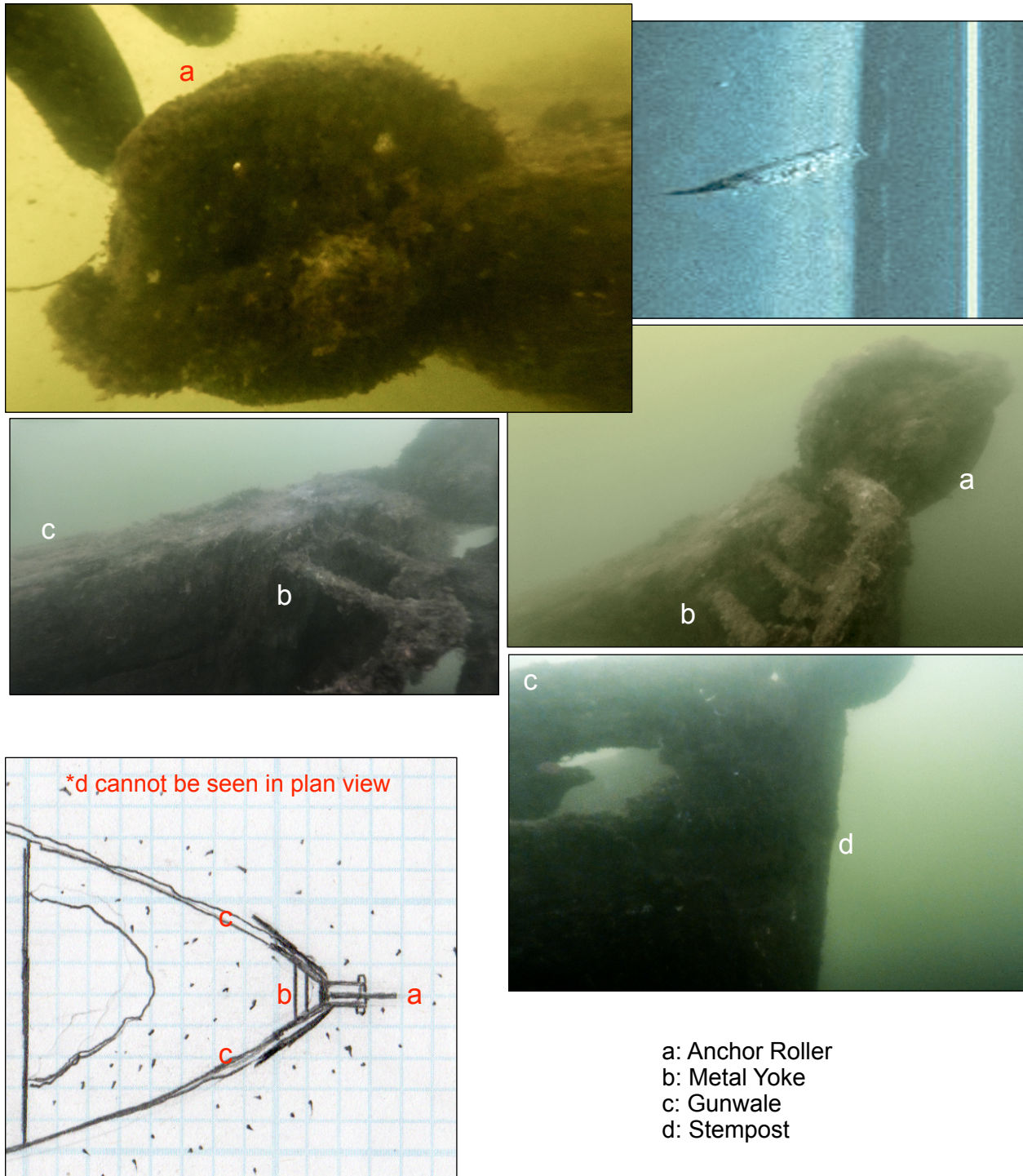


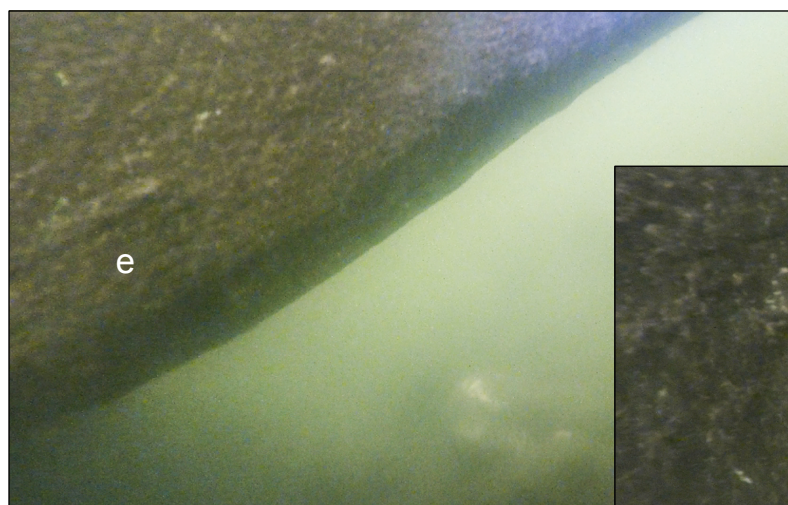


Wood and Steel Composite Wreck, 21-CR-176 (Anomaly 11)

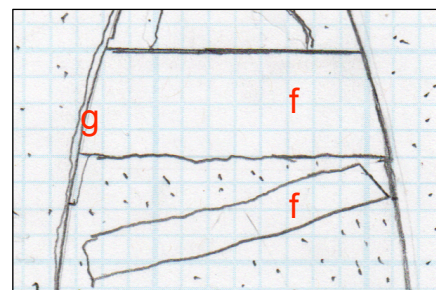
MHM recorded a sonar image of the Wood and Steel Composite Wreck (Anomaly 11) during the Lotus Lake Sonar Survey as part of the Minnesota Suburban Lakes Projects on October 18, 2020; the image was clearly a wreck. Underwater archaeological reconnaissance conducted to identify and rudimentarily document Anomaly 11 took place during the Southern and West Metro Lakes Underwater Archaeology Project. The Wood and Steel Composite Wreck is 14.30 feet long, 3.80 feet in the beam, and 2.90 feet at the transom. Anomaly 11 is comprised of a steel hull encompassed on both sides with wood - sandwiched. Overall, the wreck is heavily built and sturdy with signs of erosion from time on the lake bottom. Anomaly 11 is basically intact but with some missing hull on the starboard bow and a section of hull has a burlap covering or patch on it. The wreck has a keel and the chine is rounded, but the bottom is flattened out. The stempost is intact and is suspended in the water column since the forward part of the wreck isn't resting on the lake bottom. The pointed bow is slightly blunted with a large metal 'yoke' that caps the gunwale on both port and starboard, with an anchor roller attached to it. The yoke has 2 cross-braces for strength, a design attribute MHM has not seen on a wreck before. The gunwale is mostly intact, but worn down or missing in areas, and it is clear that it is comprised of wood sandwiched around thin steel. The transom is intact with interesting constructions at the quarters that includes 3 crude hooks attached to a metal plate on starboard with a raised metal section around it; on port, one hook is evident but the area is partially destroyed and nothing more is discernible. Several eroded frames/futtocks survive and extend above the gunwale in spots where a strake and the inner metal hull are missing; 2 oarlocks on the port side are extant. Two benches survive, fore and aft, with an amidships bench missing. The fore bench - in 2 pieces - rests on side stringers, while the aft bench has been dislodged from its place and separated into 3 pieces. Some white paint or primer can be seen in places, but red paint can be discerned all over the wreck. A metal plate with a readable 'MINNESOTA' and many other unreadable words or numbers remains attached to the

inner hull just above the forward bench on the port side. Throughout the wreck, slot-head screws hold the vessel together, and many of them are nearly completely exposed due to eroding wood. A number of larger rocks and a partial concrete block were spread throughout the hull in order to intentionally scuttle her. MHM contends Anomaly 11 was built around 1920 based on the vessel's composite construction and she sank around 1940 based on the amount of silt-build up in and around the wreck. MHM submitted a Minnesota Archaeological Site Form to the OSA and Anomaly 11 received her site number - 21-CR-176 - at that time. 21-CR-176 is protected under the Federal Abandoned Shipwreck Act of 1987 and 1954 Minnesota State Law.

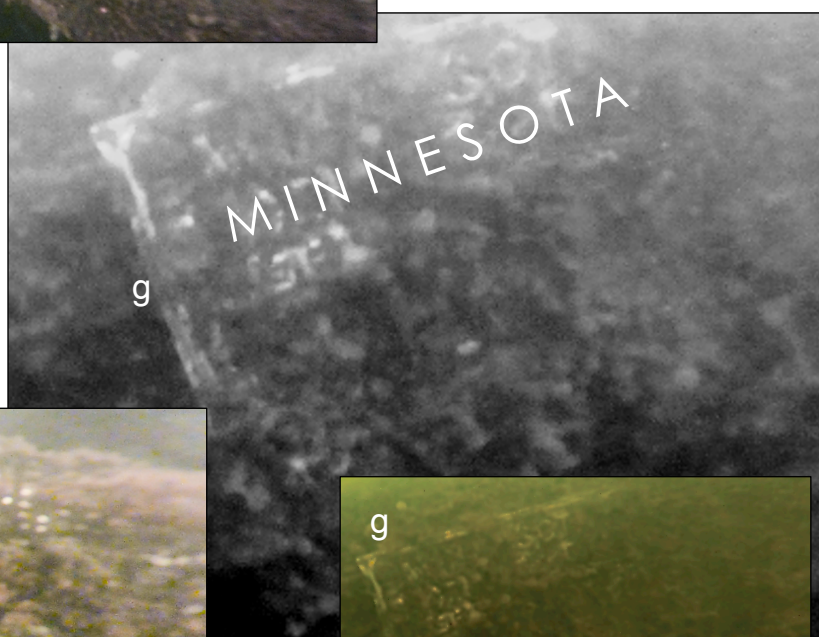


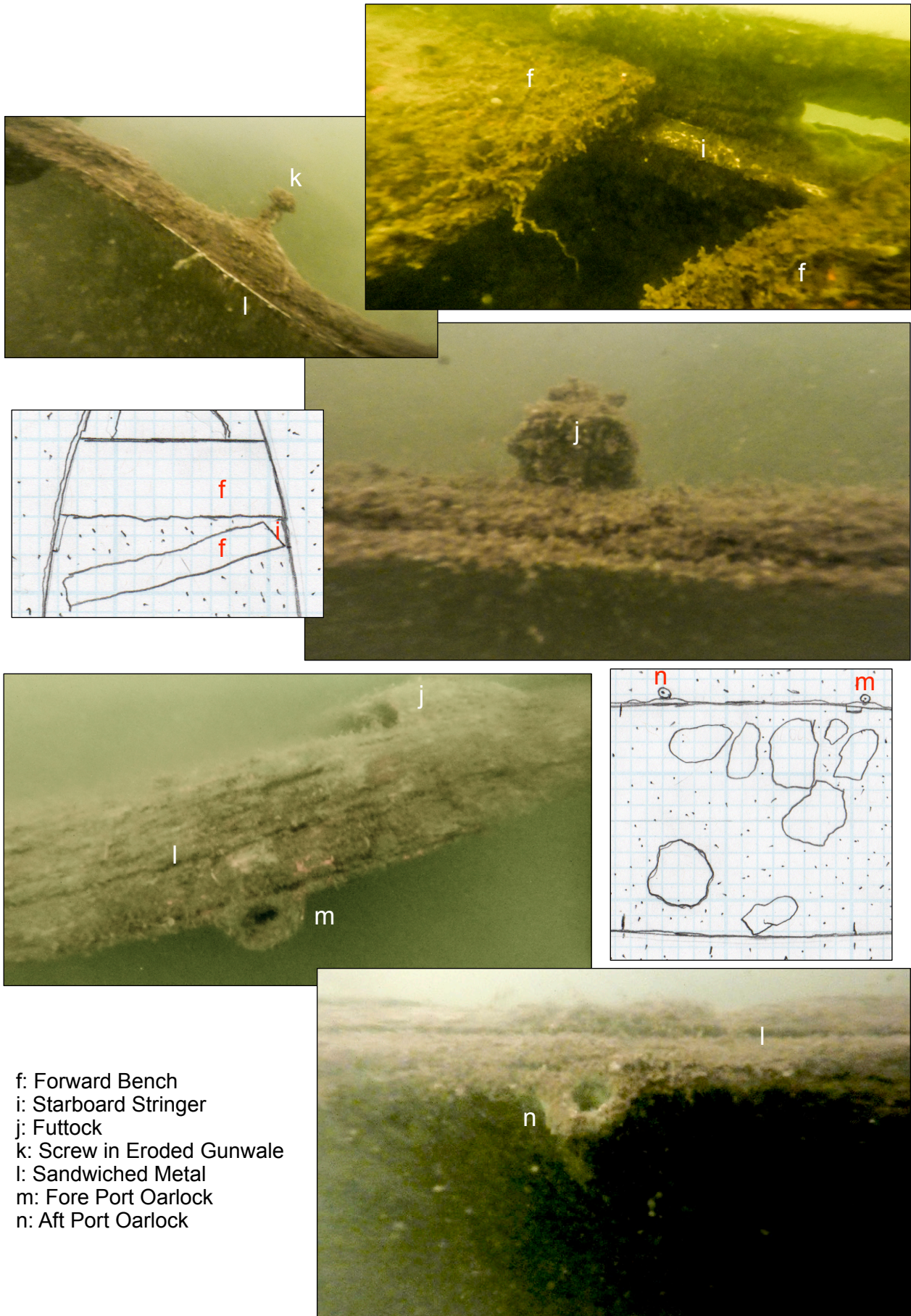


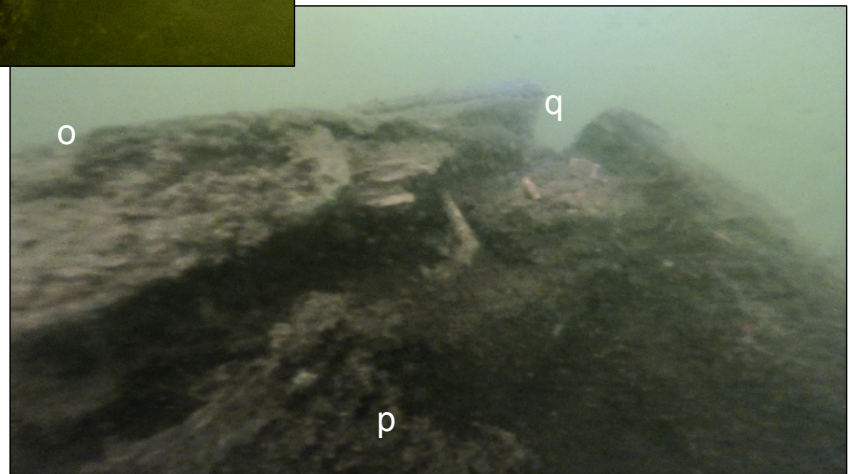
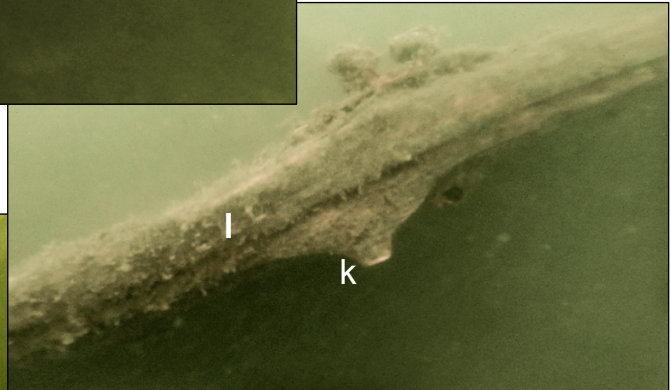
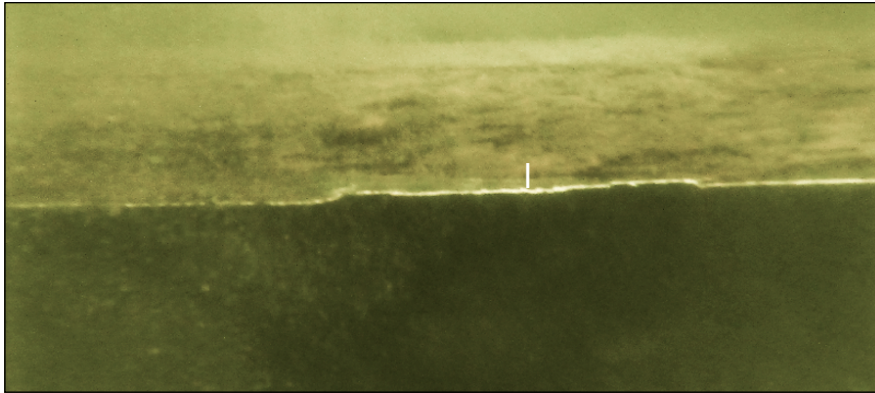
d: Stempost
e: Keel



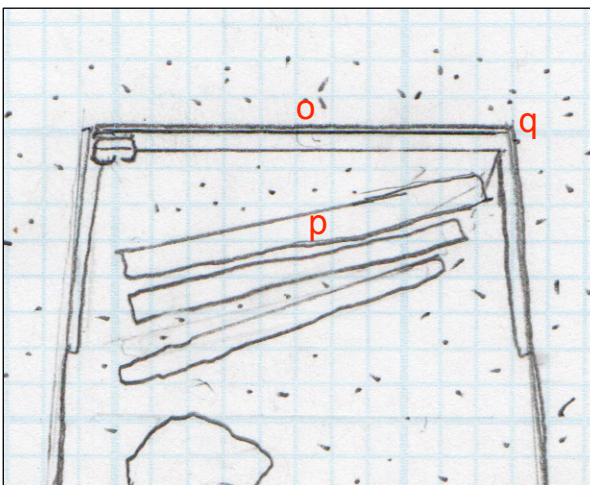
f: Forward Bench
g: Metal Minnesota Plate
h: Burlap Cover/Patch

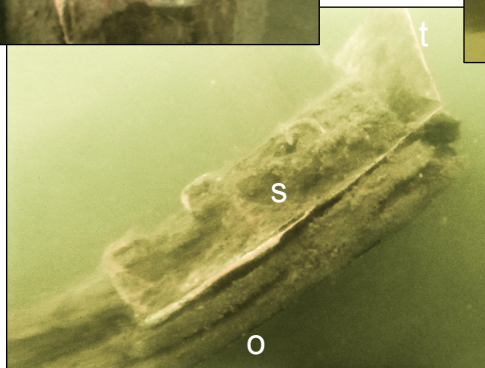
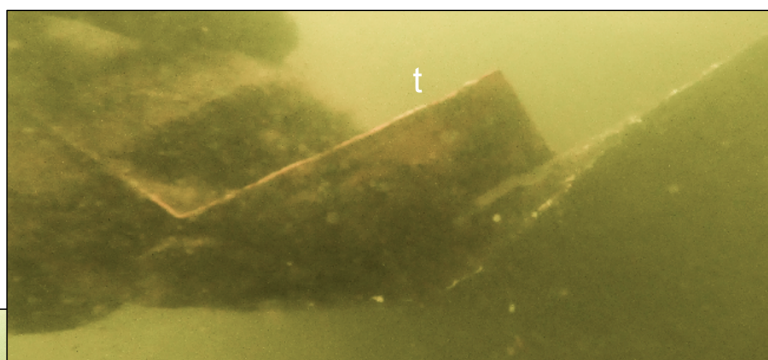
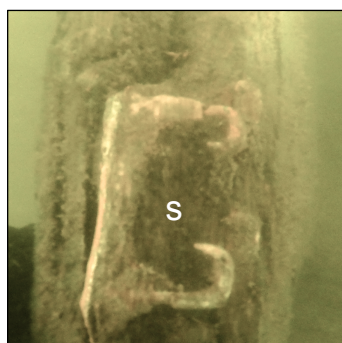
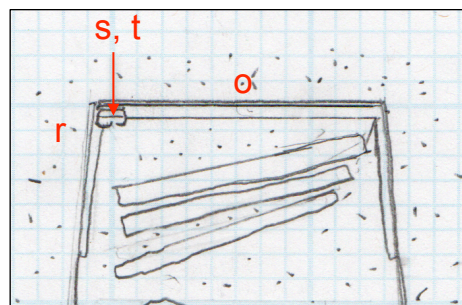
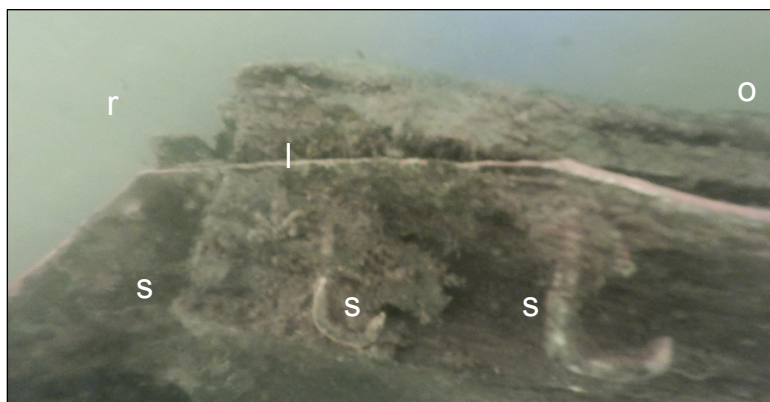




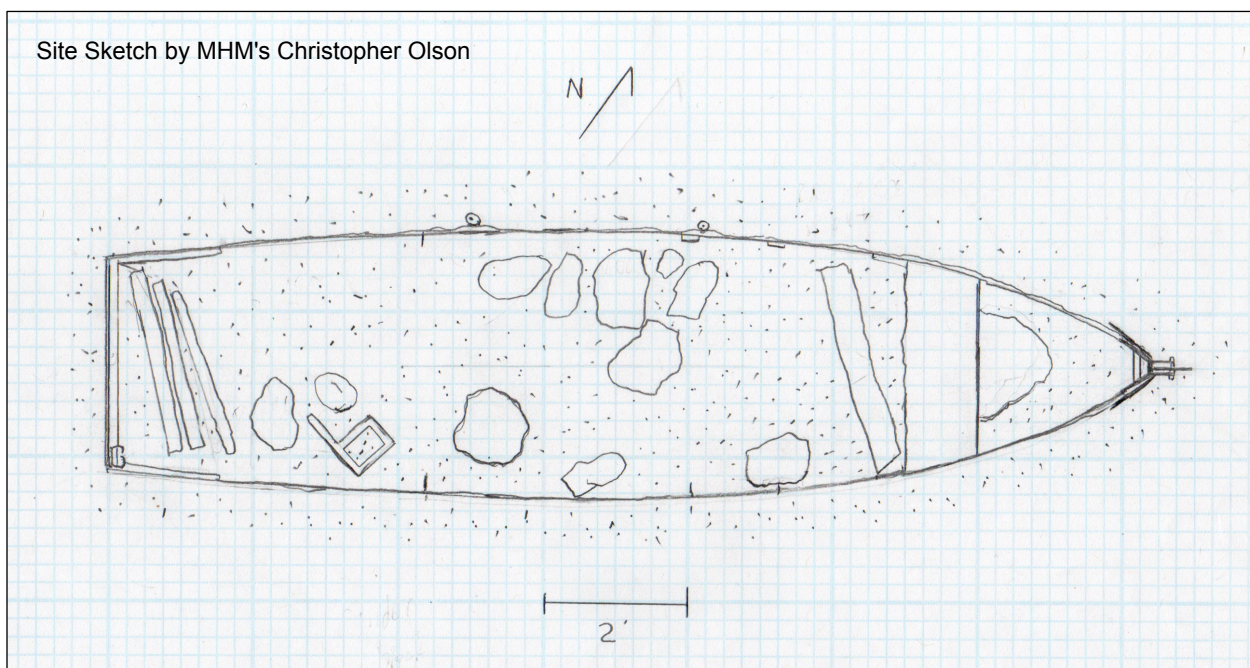


k: Screw in Eroded Gunwale
 l: Sandwiched Metal
 o: Transom
 p: Aft Bench
 q: Port Quarter



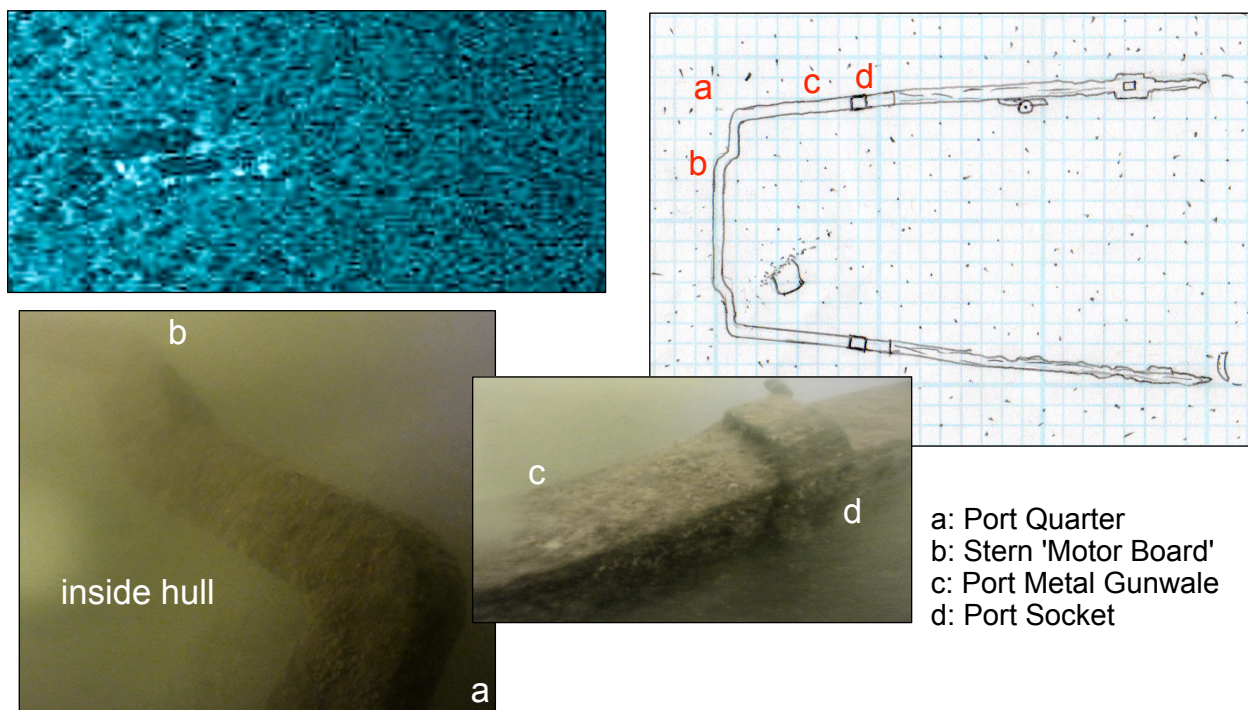


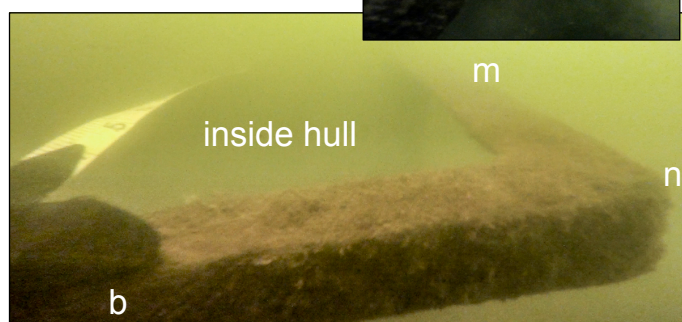
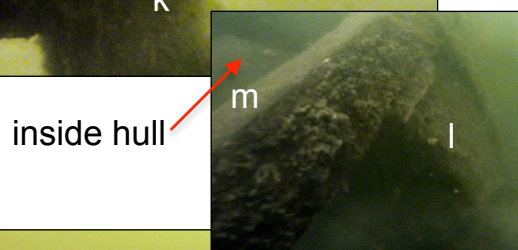
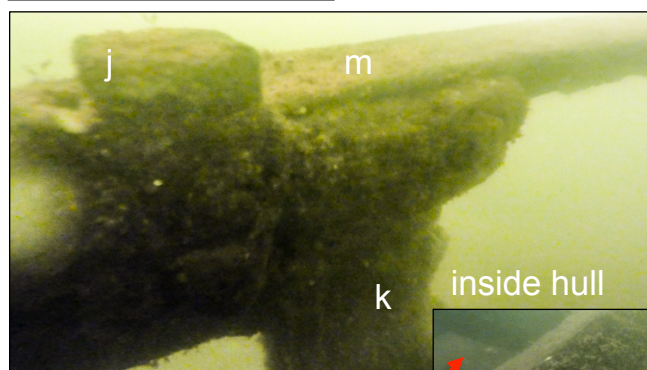
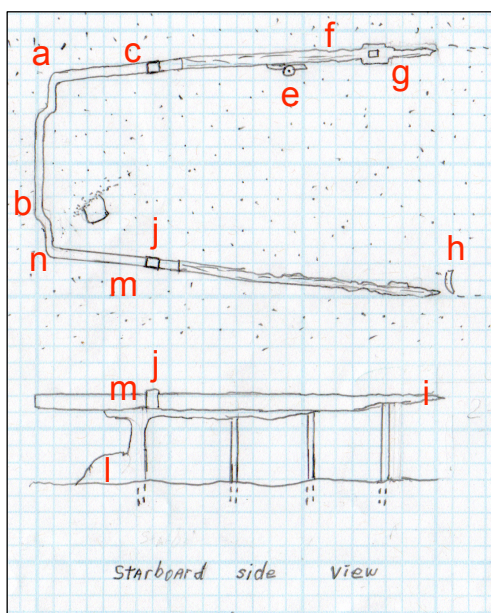
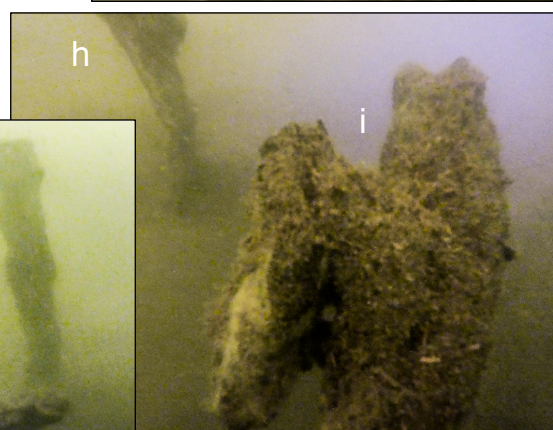
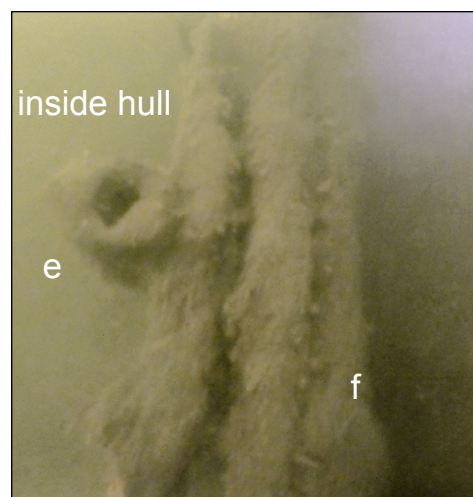
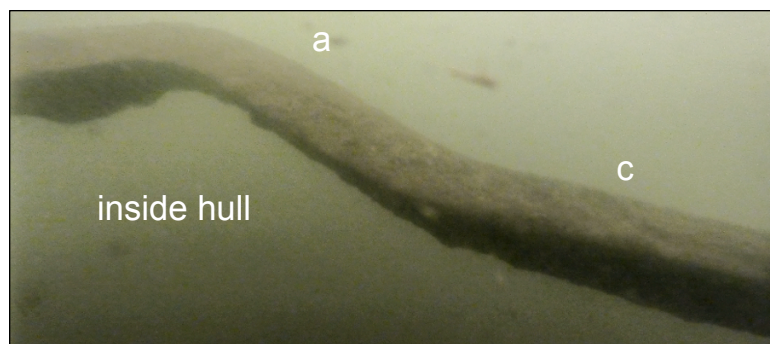
l: Sandwiched Metal
 o: Transom
 r: Starboard Quarter
 s: Metal Hooks
 t: Sandwiched Metal Extending Above Wood



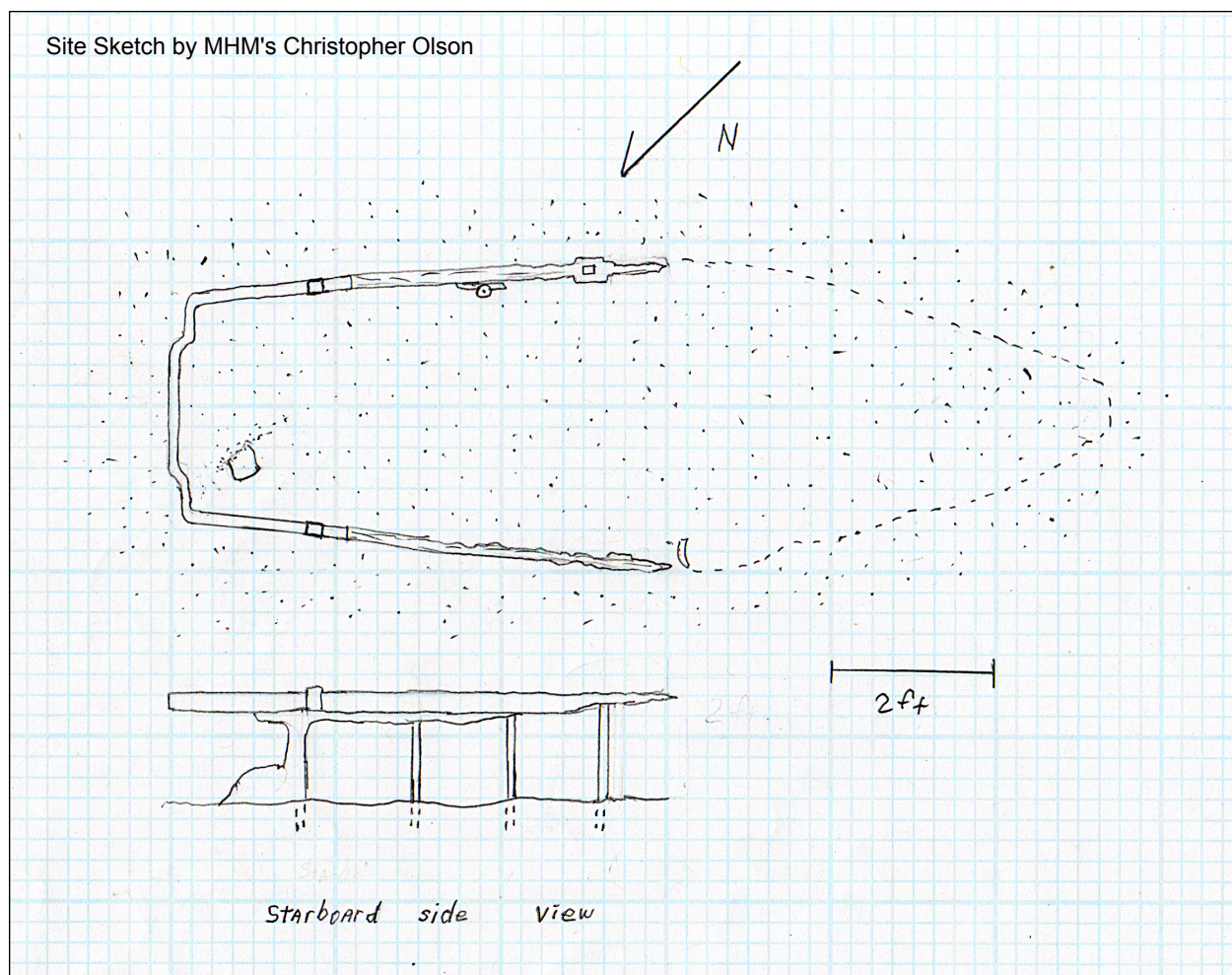
Wood and Steel Composite Wreck 2, 21-CR-177 (Anomaly 10)

MHM recorded a sonar image of the Wood and Steel Composite Wreck 2 (Anomaly 10) during the Lotus Lake Sonar Survey as part of the Minnesota Suburban Lakes Projects on October 18, 2020. Underwater archaeological reconnaissance conducted to identify and rudimentarily document Anomaly 10 took place during the Southern and West Metro Lakes Underwater Archaeology Project. The Wood and Steel Composite Wreck 2 is 11.20 feet long, 3.50 feet in the beam, and 2.80 feet at the transom. One half of the wreck is covered by silt, but MHM reached into the silt and located a damaged bow made of steel. The visible portion of Anomaly 10 is comprised of a wooden gunwale with steel frames/futtocks amidships and a finely formed steel gunwale at the quarters and stern. A 'socket' marks the location of the wood/steel gunwale joint. The stern gunwale is fashioned with a section that extends aft, creating a 'motor board' of sorts to accommodate an outboard motor. Most of the hull is missing, but bits of steel hull pieces remain attached to channel frames. On the bit of surviving hull on the starboard quarter, a metal strap on the outer hull provided additional stability. Many channel frames survive and continue to support the gunwales. One metal oarlock survives on the port side amidships attached to the wooden gunwale, and a wooden 'block' with a round hole that is outlined by a raised square is forward of the oarlock; this attribute might be a secondary or older oarlock, or a small flag or fishing rod holder. MHM contends Anomaly 10 was constructed around 1920 based on the vessel's channel frame design, an attribute MHM has documented on other similarly-constructed wrecks: Steel Boat Wreck (21-WA-114, White Bear Lake) and the Homemade Steel Boat Wreck (Anomaly 13, Lake Pulaski). The Wood and Steel Composite Wreck 2 sank around 1940 based on the amount of silt covering the damaged forward end and by contrast, the exposed amidships and stern area that has eroded over the decades. MHM submitted a Minnesota Archaeological Site Form to the OSA and Anomaly 10 received her site number - 21-CR-177 - at that time. 21-CR-177 is protected under the Federal Abandoned Shipwreck Act of 1987 and 1954 Minnesota State Law.





- a: Port Quarter
- b: Stern 'Motor Board'
- c: Port Metal Gunwale
- e: Port Oarlock
- f: Port Wooden Gunwale
- g: Port Block with Hole
- h: Standing Frame without Hull
- i: End of Wooden Gunwale Amidships
- j: Starboard Socket
- k: Inner Frame and Surviving Hull
- l: Outer Surviving Hull and Metal 'Strap'
- m: Starboard Metal Gunwale
- n: Starboard Quarter



Conclusion

MHM identified the first 3 wrecks on the bottom of Lotus Lake during the LLUA Project - the Wooden Lapstrake Wreck (21-CR-178), Wood and Steel Composite Wreck, 21-CR-176), and the Wood and Steel Composite Wreck 2 (21-CR-177). The newly recognized wrecks offer significant and interesting data into the maritime history of the Lotus Lake area in terms of small watercraft use by west metro Minnesotans. MHM contends the 2 composite wrecks, 21-CR-176 and 21-CR-177, represent small work boats in the Minnesota archaeological record. The heavy build of both wrecks are indicators of how the boats handled on the water - slowly and likely steady. However, the fragmentary nature of 21-CR-177 does not allow for a complete analysis of the wreck's attributes and construction. Additionally, surviving evidence on 21-CR-176 - the numerous metal hooks and anchor roller - suggests the boat was also used for fishing. Further, her largely intact hull clearly exhibits the 'sandwiched' nature of the steel surrounded by wood. This type of composite small watercraft construction is rarely seen, and the 'sandwiched' nature of 21-CR-176's hull is unique in Minnesota's archaeological record. The Homebuilt Wood and Steel Composite Wreck (21-HE-562)¹

¹Merriman and Olson 2022, 14-18

in Lake Minnetonka is contemporary with Anomaly 11, but this wreck is a wooden boat sheathed in steel - also a unique site in our state's archaeological record.

The Wooden Lapstrake Wreck, along with 2 similar wrecks in nearby Christmas Lake (21-HE-541)² and Lake Minnetonka (21-HE-513)³, are a series of small boats that reflect design and construction differences during the first 2 decades of the 20th Century. Basically, the Wooden Lapstrake Wreck is less technologically advanced than the other 2 wrecks in Christmas Lake and Lake Minnetonka in terms of her crude stern construction and sparse use of frames. Yet, 21-CR-178 is lapstrake-built as opposed to the simpler carvel-built construction of 21-HE-513 and 21-HE-541. These types of differences in nautical technology reflected in small Minnesota watercraft - constructed at roughly the same time and used within 4 miles of each other - supports MHM's theories, methods, and goals behind locating, documenting, and analyzing our state's Nautical Archaeological sites. In short, the design and construction of these 3 small boats are reflections of the boatwright's ability based on attributes documented on the wrecks.

As a whole, the SWMLUA Project produced interesting and significant results investigating 24 anomalies in 4 lakes in 3 counties using SCUBA. MHM dove upon and identified 11 wrecks, 2 maritime sites, and 4 'other' objects in Lotus Lake, Lake Minnewashta, Prior Lake, and Crystal Lake. Of the 11 wrecks, MHM acquired Minnesota Archaeological Site Numbers for 7 of them: 3 in Lotus Lake, 1 in Prior Lake, and 3 in Crystal Lake. The documentation of these sites and similar wrecks in the future will provide historians and scholars with opportunities to further study, explain, and analyze these protected submerged cultural resources. The wrecking processes responsible for the creation of Minnesota's submerged cultural resources have produced a variety of underwater sites. Identifying, comparing, and associating these new sites in Lotus Lake, Lake Minnewashta, Prior Lake, and Crystal Lake, along with known sites increases our understanding of the historical context within which these cultural resources operated or were exploited by Minnesotans. Future studies will greatly enhance our shared maritime history through the recognition of submerged cultural resources and the stories behind their construction and disposition. The diversity of nautical, maritime, and underwater sites so far identified by MHM in Minnesota's lakes are tangible examples of the rich maritime history of the area.

MHM continues to re-examine recorded sonar footage from completed remote sensing surveys. Targeted re-scanning has occurred in several lakes using knowledge gained from the comparison of anomalies that have proven to be wrecks or other submerged cultural resources in past projects. With improved technology, future scanning projects will produce clearer data. The results of the SWMLUA Project summarized above is connected to all the work that came before and will come after its completion. At this point, watercraft located in Minnesota's suburban lakes represent approximately 1,000 years of Minnesota's maritime history and nautical archaeology. In the historic period, the known wrecks represented in these lakes span around 150 years of local maritime culture. It is clear – even through this Phase 1 pre-disturbance nautical archaeological investigation – that the types of sites that exist in Minnesota's suburban lakes

²Merriman and Olson 2021, 26-28

³Merriman and Olson 2018, 15-17

documented to date are diverse, archaeologically and historically significant, and worthy of great attention. Through research, diving on wrecks and anomalies to collect pertinent data, and ensuring that the collected information is accessible by the public, MHM will continue to investigate Minnesota's submerged cultural resources into the future.

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